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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,098

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EXAMINER

HODGE, ROBERT W

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/700,098	<b>Applicant(s)</b> TANAKA ET AL.	
	<b>Examiner</b> ROBERT HODGE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-13, 16, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-13, 16, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/19/07</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

Applicant's amendment to the title of the application is accepted and the objection to the specification is withdrawn.

Applicant's arguments filed 12/19/08 have been fully considered but they are not persuasive. Applicants' main argument is that the combination of Gyoten and Stonehart does not teach a catalyst layer that is chemically bonded to a molecule comprising an ion-conducting functional group serving as an electrolyte to a surface of the other particles and that said bond is not covalent. Gyoten teaches in column 15, lines 34-36 "The above hydrogen ion diffusion layer can be formed by chemically bonding [emphasis added] a silane compound to the surface of the catalyst particle or the carrier of the catalyst particle". It is noted that a Silane group contains silicon and has the general formula  $\text{Si}_n\text{H}_{2n+2}$ . By the addition of silica from Stonehart the Examiner asserted that a reasonable expectation of success would be achieved in Gyoten as modified by Stonehart and that the limitation of the claims are met and the burden was shifted to applicants to prove otherwise. Applicants have not met that burden, applicants have provided no evidence that the combination of Gyoten and Stonehart will not produce the same results as the instantly claimed invention. It is still the position of the Examiner that by said combination the instantly claimed invention has been found in the combined prior art especially since Gyoten is reacting a silicon containing molecule and by the addition of another silicon containing molecule (silica) it too will react in the chemical reaction of Gyoten see MPEP 2144 (II).

## II. >< THE EXPECTATION OF SOME ADVANTAGE IS THE STRONGEST RATIONALE FOR COMBINING REFERENCES

The strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. *In re Sernaker*, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983). >See also *Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*, 464 F.3d 1356, 1368, 80 USPQ2d 1641, 1651 (Fed. Cir. 2006) (“Indeed, we have repeatedly held that an implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the improvement’ is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—we have held that there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves.”).

Conclusory statements are not probative unless supported by facts. See *Ex parte Gray* 10 USPQ 2d 1922 (BPAI 1989); *In re de Blauwe* 222 USPQ 191, 196 (Fed. Cir. 1984); *In re D’Ancicco* 172 USPQ 241 (CCPA 1972); *In re Grunwell* 203 USPQ 1055 (CCPA 1979); *Meitzner v. Mindick* 193 USPQ 17; *In re Brandstandter* 179 USPQ 286, 294 (CCPA 1973); *In re Lindner* 173 USPQ 356; and *In re Smith* 74 USPQ 207.

>If a *prima facie* case of obviousness is established, the burden shifts to the applicant to come forward with arguments and/or evidence to rebut the *prima facie* case. See, e.g., *In re Dillon*, 919 F.2d 688, 692, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990). Rebuttal evidence and arguments can be presented in the specification, *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995), by counsel, *In re Chu*, 66 F.3d 292, 299, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995), or by way of an affidavit or declaration under 37 CFR 1.132, e.g., *Soni*, 54 F.3d at 750, 34 USPQ2d at 1687; *In re Piasecki*, 745 F.2d 1468, 1474, 223 USPQ 785, 789-90 (Fed. Cir. 1984). However, arguments of counsel cannot take the place of factually supported objective evidence. See, e.g., *In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984).

With regards to the product-by-process limitations in the instant claims, applicants should be aware that in a product by process claim, applicants must show that the process materially alters the product to overcome a rejection made on the product by the prior art, which show the product is known MPEP 2113. Again applicants' burden has not been met showing that the instantly claimed process in the product claims indeed materially alters the product.

### ***Information Disclosure Statement***

The information disclosure statement filed 12/19/08 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered. The Japanese office action listed in the Other Documents section has not been translated and no statement of relevance

regarding the content of said action has been provided therefore it has not been considered.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7,10-13,16,19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gyoten et al. (US 6,746,793 A1) in view of Stonehart et al. (US 5,523,181).

With respect to claims 1 and 10, Gyoten et al. disclose a polymer electrolyte fuel cell comprising a pair of electrodes having each a catalytic reaction layers, the electrodes sandwiching a polymer electrolyte membrane wherein a hydrogen ion diffusion layer is provided on either surface of a catalyst particle. The hydrogen ion diffusion layer can be formed by chemically bonding a silane compound to the surface of the catalyst particle or the catalyst particle (figure 13, column 15, lines 29-54). Gyoten et al. disclose conducting HCl elimination reaction with  $-\text{SiCl}_3$  group,  $-\text{OH}$  group or other function group or oxide, a monomolecular adsorption film is formed with a silane compound on the surface of the catalyst or on the surface of the carbon carrier. See Column 18, Line 63 to Column 19, Line 1.

However, Gyoten et al. do not disclose the addition of other particles in the catalyst layer.

Stonehart et al. teach a polymer electrolyte assembly wherein the cathode catalyst layer and the anode catalyst layer comprising platinum, NAFION and silica. The additional of silica in the cathode catalyst layer can prevent water generated by the electrode reaction on the cathode catalyst layer from vaporizing into the gas phase. The addition of silica in the anode catalyst layer can prevent the anode from drying and promote reverse transport of water from the cathode side to the anode side. See Column 5, Lines 51 to Column 6, Line 13 and Example 2.

Therefore, it would have been obvious to one of ordinary skill in the art to add silica to the catalyst layers of Gyoten et al., because Stonehart et al. teach use of silica to improve the performance of the resulting fuel cells.

Moreover, the combined references do not specifically disclose the silane is chemically bonded to the surface of the silica particle via an oxygen atom. However, it is the position of the examiner that such characteristics are inherent, given that Gyoten and Stonehart utilize the same molecular compound and silica particles in the forming of catalyst layers. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 2, Gyoten et al. disclose the mean molecular weight of silane compound is 40-10,000. See Column 19, Lines 10-55.

With respect to claim 3, Gyoten et al. disclose the silane compound has a functional group capable of dissociating a hydrogen ion at the end and has at least one of a hydrocarbon chain and a fluorocarbon chain. See Column 15, Lines 46-50.

With respect to claims 4-6, Gyoten disclose a hydrolysable group that converts into an activated silanol group and reacts with an oxide on the surface, which permits formation of a covalent bond. The silane compound has a hydrogen ion dissociating functional group such as sulfonic group or carboxyl group. See Column 16, Lines 6-14.

With respect to claim 7, Gyoten et al. disclose that by making this silane compound having a basic functional group containing a nitrogen atom having a lone pair at the end, for example, an amid group or an amine group, mutual reaction with a polymer electrolyte having a residual group of an acid such as sulfonic acid can be caused. See Column 17, Lines 44-49.

With respect to claim 11, Gyoten et al. disclose the use of platinum particle as the catalyst. See Column 18, Lines 55-56.

With respect to claims 12, 13 and 16, Gyoten et al. disclose the use of carbon powder in the catalyst layer that is an electron conductor. The carbon powder has an average diameter of 2 to 10 microns. See Column 9, Lines 22-23.

With respect to claim 19, Gyoten et al. disclose the catalyst having a thickness of 30-100 microns. See Column 1, Lines 43-44.

The examiner notes that claim 20 is a product-by-process claim. "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps". See MPEP § 2113. Therefore because all of the



structure recited in claim 20 is present in Gyoten as modified by Stonehart, claim 20 is included in the above 103(a) rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT HODGE whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. H./  
Examiner, Art Unit 1795

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795